CLIC PAPERS

TECHNOLOGY GUIDELINES AND POTENTIAL MILITARY APPLICATIONS IN LOW INTENSITY CONFLICTS

Army - Air Force Center for Low Intensity Conflict

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The paper lists nine proposed technology guidelines to use whenever developing and/or selecting a LIC technology application. The paper then provides a list of potential needs in the four operational categories associated with LIC: insurgency and counterinsurgency, peacetime contingency operations, combatting terrorism, and peacekeeping operations.

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TECHNOLOGY GUIDELINES AND POTENTIAL MILITARY APPLICATIONS

IN

LOW INTENSITY CONFLICTS

by

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Army-Air Force Center for Low Intensity Conflict
Langley Air Force Base, Virginia 23665-5556

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THE ARMY-AIR FORCE CENTER FOR LOW INTENSITY CONFLICT

The mission of the Army-Air Force Center for Low Intensity Conflict (A-AF CLIC) is to improve the Army-Air Force posture for engaging in low intensity conflict (LIC), elevate awareness throughout the Army-Air Force of the role of the military power in low intensity conflict -- including the capabilities needed to realize that role -- and provide an infrastructure for eventual transition to a joint and, perhaps, interagency activity.

CLIC PAPERS

CLIC PAPERS is an informal, occasional publication sponsored by the Army-Air Force Center for Low Intensity Conflict. They are dedicated to the advancement of the art and science of the application of the military instrument of national power in the low intensity conflict environment. All military members and civilian Defense Department employees are invited to contribute original, unclassified manuscripts for publication as CLIC PAPERS. Topics can include any aspect of military involvement in low intensity conflict to include history, doctrine, strategy, or operations. Papers should be as brief and concise as possible. Interested authors should submit double-spaced typed manuscripts along with a brief, one-page abstract to the Army-Air Force Center for Low Intensity Conflict, Langley AFB, VA 23665-5556.

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A185 974	Security Assistance and LIC: A Challenge to Excellence
A185 975	The Role of Reserve Forces in LIC
A185 976	Compilation of References and Bibliography, Volume I: An Annotated Bibliography on LIC Taken from the Joint LIC Project Final Report of 1 August 1986
A185 977	Army Medical Department Roles and Functions in LIC
A185 978	Operational Art in LIC
A186 280	LIC Imperatives for Success
Pending	Modern Terrorism: The Potential for Increased Lethality
Pending	US Aid to Democratic States Facing Totalitarian Revolutionary Warfare: Twelve Rules

PREFACE

Low intensity conflict (LIC) has played an increasingly conspicuous role in the strategic planning programs of the Armed Forces. This paper looks at technology and the tools it produces as an essential ingredient needed to win in LIC. Those who possess the technological high ground are not guaranteed success. What is needed is a superior civil-military organization with the right strategy and the right technology tools. With the proper application of these three key ingredients, the US and our allies can win decisively in LIC.

The paper lists nine proposed technology guidelines to use whenever developing and/or selecting a LIC technology application. The paper then provides a list of potential needs in the four operational categories associated with LIC: insurgency and counterinsurgency, peacetime contingency operations, combatting terrorism, and peacekeeping operations.

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TECHNOLOGY GUIDELINES AND POTENTIAL MILITARY APPLICATIONS IN LOW INTENSITY CONFLICTS

Introduction

Part I of this paper discusses the general environment in which low intensity conflicts (LIC) occur and suggests nine guidelines for developing and/or selecting technologies for use in LIC. Part II lists potential needs in the four LIC operational categories: insurgency and counterinsurgency, peacetime contingency operations, combatting terrorism, and peacekeeping.(1) Part III provides some concluding remarks.

This paper does not attempt to cover all the technologies applicable in LIC. The list of potential technology tools is virtually endless. But the **real key**, which will make technology tools work in LIC, is a proper organization with a good strategy and plan. Sir Robert Thompson, a noted counterinsurgency strategist, provides the following insight:

> In studying any revolutionary war, therefore, when it breaks out into guerrilla warfare at the beginning of the second phase, it is necessary to assess whether its organization or its ostensible cause (often no more than a pretext) is the vital factor because this will dictate the emphasis of the response. If the organization is the vital factor, then revolutionary movement will not be defeated by reforms designed to eliminate the cause. It will only be defeated by establishing a superior organization and applying measures designed to break the revolutionary organization.(2)

Technology will have found its real niche in LIC if the US and our developing nation allies use it to build and support such a superior government organization. The applied technologies should:

- Multiply force effectiveness.
- Make external support costs to adversaries prohibitive.
- Make adversaries constantly fear being neutralized.
- Make the people feel secure and confident they are not endangered by their own government.

Two examples in Central America serve to illustrate the importance of a proper organization. One Central American country received scant US aid and possessed very little "high tech" equipment to conduct its counterinsurgency efforts. It instituted an aggressive civil defense plan; the civilians patrolled and gathered information against the insurgents. This enabled the military to focus its limited resources. In less than 4 years, their insurgency was substantially neutralized. By

contrast, another Central American country receives large amounts of US aid and technology for its counterinsurgency efforts. Not withstanding other variables, their war continues after more than 7 years. Technology and large amounts of aid by themselves will not win in LIC. **The right civil-military organization, the right strategy, and the right technology tools** can defeat the adversaries the US and our allies face, whether they wear the mask of the terrorist, narcotics trafficker, or insurgent.

PART I

LOW INTENSITY CONFLICT TECHNOLOGY GUIDELINES

The Environment

Low intensity conflict has been described by Vice President Bush as "the most active threat we face today . . . the war in the shadows . . . . This threat is manifested in a stream of hostage crises, terrorist attacks, local conflicts, and insurgencies. This is our most active threat for the remainder of the century . . . ."(3)

For our allies engaged in the various forms of ambiguous warfare included in LIC, it is certainly not "low intensity." Those unfortunate enough to be innocent bystanders during a terrorist attack know there is nothing "low intensity" about it. Developing nations combatting insurgencies are frequently engaged in a struggle for national survival--a total war. However, from the US perspective, these conflicts pose little immediate risk to US national security, especially when compared to a nuclear exchange. Hence comes the term low intensity conflict.

The current Joint Chiefs of Staff (JCS) definition of LIC is:

> A limited politico-military struggle to achieve political, social, economic, or psychological objectives. It is often protracted and ranges from diplomatic, economic, and psychosocial pressures through terrorism and insurgency. Low intensity conflict is generally confined to a geographic area and is often characterized by constraints on the weaponry, tactics, and the level of violence.(4)

The White House paper on National Security Strategy of the United States, dated January 1987, amplifies and clarifies the current JCS definition:

> Low Intensity Conflicts . . . take place at levels below conventional war but above the routine, peaceful competition among states . . . . They often involve a protracted struggle of competing principles and ideologies . . . [and] may be waged by a combination of

means, including the use of political, economic, informational, and military instruments. They are often localized, but can have significant regional and global security implications.

Major causes of Low Intensity Conflict are instability and lack of political and economic development in the Third World . . . . The resulting conflicts are of concern to the United States when they assault U.S. national interests and the security, values, or political foundations of the United States, our friends, and allies. Low Intensity Conflict can gradually isolate the United States, its allies, and major trading partners from the Third World and from each other. This isolation can be manifest in economic, political, and military terms.

When it is in U.S. interest to do so, the United States:

- Will take measures to strengthen friendly nations facing internal or external threats to their independence and stability by systematically employing, in coordination with friends and allies, the full range of political, economic, informational, and military instruments of power. Where possible, action will be taken before instability leads to violence.

- Will work to ameliorate the underlying causes of instability and conflict in the Third World by pursuing foreign assistance, trade, and investment programs that promote economic development and the growth of democratic social and political orders.

- May support selected resistance movements acting in opposition to regimes working against U.S. interests . . . .

- Will take steps to discourage Soviet and other state-sponsored adventurism, and increase the costs to those who use proxies or terrorist and subversive forces to exploit instability in the Third World.(5)

The preceding policy statements provide a broad range of technology opportunities in LIC. This paper will be concerned with military applications under the security assistance program. The areas of economic development technologies are, for the most part, outside the scope of this paper.

Nine Technology Guidelines

Determining the technological and equipment needs of our developing nation allies and our own military forces is a key issue in LIC. In some cases, their equipment needs are the same as ours; but, as this paper suggests, they frequently are not. Most US equipment is designed and built to satisfy requirements of mid- to high-intensity warfare on a worldwide basis. This requirement frequently makes it very complex and expensive. Much of what we have is just too expensive for purchase by many of our allies. Solving this issue--how to realistically resource and develop technologies to meet US needs across the entire conflict spectrum and still provide the systems our allies need to win in LIC--will be one of the keys to effective US LIC policy and strategy. The technology applications should:

- o Counter devices giving undue leverage to opponents.
- o Be easily adaptable to varying global needs.
- o Be sustainable from readily available resources.
- o Be threat-appropriate and judiciously economic.
- o Sustain long-term economic growth when war ends.
- o Be simple to operate for the "average" user.
- o Yield superior intelligence and communications results.
- o Give cost effective tools to freedom fighters.
- o Not be a substitute for organizational inadequacy.

To aid decision-makers in selecting and developing LIC technology applications, each of these nine guidelines is discussed in more detail.

Technology should provide countermeasures against devices which provide undue leverage to adversary efforts. Land and sea mines require tremendous resources to counter. The expenditures in the Persian Gulf to counteract floating sea mines are enormous, running into millions of dollars every day. Some estimate these sea mines only cost ten thousand dollars. This cost disparity needs to be drastically reduced. Technology can help eliminate the undue leverage the sea mines create. Land mines are equally troublesome. They can disrupt the local economy and create fear among the civilian populace. They also create a perception the government is powerless to protect its people. Technology should provide cost effective countermeasures.

Technology devices should have a "bare bones" architecture which provides "building block" adaptability to varying global mission complexities. Many US systems are made to meet worldwide, worst case requirements--a form of "one size fits all" thinking. Such thinking may violate an imperative for engaging in LIC: adaptability.(6) For example, many LIC targets are man-sized, non-radar significant, fleeting, and difficult to locate by air. Our experience in Vietnam indicated a slow-moving aircraft was needed to find and mark such targets. This role was

given to the forward air controller or FAC. Today there is discussion of a new FAC aircraft, which must survive in a high threat environment. Consequently, it is very maneuverable and high speed, which may make it unsuitable for finding many LIC targets. It also makes such a system too complex and expensive for many of our allies. This lack of affordable adaptability can pose serious limitations on US interests. A more competitive LIC strategy needs to be developed. Some suggest employing an inexpensive "bare bones" STOL aircraft represents such a competitive strategy. It would have simple technology, be easy to sustain, and fill multiple roles. Through proper design, a simple module could be added to perform various missions such as a gunship or reconnaissance platform. If such an inexpensive airframe can be built, then it could meet many of our allies' needs. "Large quantity" purchases by many of our allies may help keep the price down, substantially enhancing this strategy.(7)

Applied technologies should be sustainable from readily available resources in a specific country or region. As an example, some US radios require special batteries. However, with proper design, readily available commercial batteries could do the job. True, commercial batteries would not last as long as special batteries, would not meet military specification standards, and might not work well in certain climates such as the arctic. But commercial batteries could work in most cases and significantly reduce logistic support requirements. By using readily available commercial products, you also help our allies' economy to grow.

Applied technologies do not have to be "state of the art," but should be appropriate to meet the threat and be "judiciously economic." Put another way, you don't need a robot-controlled sledgehammer to kill a mosquito. Many people automatically think "high tech" is the panacea for LIC ills. Others think "low or old tech" is needed. Both camps can be correct. In the British experience in the Falklands, sophisticated radar surveillance systems on the Nimrod aircraft proved invaluable.(8) Simpler technologies like air refueling probes proved equally effective in providing a "winning" mix. Another example comes from David versus Goliath in the Bible.(9) David's original counsel was to use the latest technology. However, he was unfamiliar with its use and felt more comfortable with his slingshot. This simple but old technology was also maintainable, easy to fix, and ammunition was plentiful. It proved sufficient to meet the threat and defeat the enemy.

Technology should sustain long-term growth of the developing nation when insurgency is no longer a factor. Developing a munitions factory is one example. If the manufacturing process is properly structured, the different skills can be employed to meet other needs. For example, metal working skills used to make shell casings have broad application in many other manufacturing industries. Chemicals to make explosives can also be used to

make fertilizer. Industries with only military applications leave developing nation economies out of balance when their war is over.

Applied technologies should be simple to operate and should consider the "average" user's skill level. Let's examine computer startup procedures. In the early sixties, starting a computer took a long time and required many different programs be run in a precise sequence. Today, the operator turns the power on and the rest is done automatically with little or no input required. We can take a lesson from the terrorists here. They don't normally use complicated weapons. What really counts is simplicity and reliability.(10) Designing a system to meet US needs that is usable by the "average" developing nation operator is another challenge. The M-16 rifles purchased by El Salvador came with standard stocks. However, due to the size of the average El Salvadoran soldier, the trigger was just barely in reach. This made accurate aiming difficult. The stock needed to be about two inches shorter to correct the problem.

Complex, superior technology should be applied to intelligence and communications activities.(11) These activities give both the illusion and reality of superior government control. With lawful application, they help establish positive control of movement and resources. Even though the technology inside the "black box" may be extremely complicated, it can still be user friendly and simple to operate. Using accurate intelligence and good operations and communications security, the government can frequently target "specific" adversaries. The feeling of being singled out can seriously undermine the adversary's organizational security and morale.

When the US supports freedom fighters, technology should produce economically viable force multipliers. The products developed should help the freedom fighters gain significant leverage against their adversaries. These tools should help make costs of repressing freedom prohibitive. Rather than continue toward bankruptcy, totalitarian governments may accede to the people's demands for true freedom. This is the essence of competitive strategies. Take the Stinger missile for instance. Critics said it could not do the job because of its small warhead and high failure rate in austere operating conditions. In Afghanistan, the Mujahideen have clearly shown otherwise. While it costs only seventy-five thousand dollars, it downs eight million dollar Soviet helicopters like the Mi-24 on over 70% of all launches.(12) This kind of technology yields about a one hundred-to-one favorable cost ratio. It makes Soviet support to the Afghan government very expensive compared to the support the freedom fighters receive.

Technology cannot be a substitute or replacement for effective human infrastructures in developing nations. With the US propensity for the "quick fix," technological innovation is an

easy way of giving the impression of immediate activity. If a government security force is improperly structured and does not use information readily available to it, then it will be ineffective. If it also lacks a long-range plan, then pouring large quantities of technological widgets will not correct the "root" problem. Developing **the right organization**, with **the right strategy**, and **the right tools** cannot be overemphasized!

PART II

POTENTIAL LOW INTENSITY CONFLICT NEEDS

This part looks at many potential technology applications in the four operational categories of LIC: insurgency and counterinsurgency, peacetime contingency operations, combatting terrorism, and peacekeeping operations. While examining these potential needs, all nine guidelines should be kept in mind.

Potential Counterinsurgency Needs

Counterinsurgency (COIN) is those military, paramilitary, political, economic, psychological, and civic actions taken by a government to defeat subversive insurgency.(13)

Use of US combat forces is normally viewed as a last resort. As a result, most US efforts will be through training and technical assistance via the security assistance program.(14) There are several potential COIN needs our allies may require. The following is a partial list:

- Intelligence fusion systems.
- Complete system packages.
- Effective countermine equipment.
- Effective night vision equipment.
- Sustainable equipment.
- STOL aircraft.
- Low cost, secure, compatible, and mobile communications.
- Environment-unique surveillance systems.

Each of these technology applications will now be covered.

Intelligence Fusion Systems. Research by the Small Wars Operations Research Directorate in US Southern Command and many others has suggested one of the cornerstones to any COIN strategy is effective intelligence.(15) A good human intelligence organization is often the most effective tool for use in COIN operations. But, a lot of technical intelligence capability can and should be brought to bear. Developing a "basic system" to meet both allied and US needs should be considered. Look at unattended ground sensors (UGS) and sensor-equipped remotely piloted vehicles (RPV). These devices can collect tremendous amounts of data. However, filtering the "data glut" to find useful information is quite another matter. This task may be

beyond some allies' technical capabilities. The US could perform the technical "fusion," providing our allies with timely combat information. Should US combat forces be introduced into the conflict, this same information could be readily available to US combat commanders.

Complete System Packages. In El Salvador in 1979, M-16 rifles were procured for the El Salvadoran Armed Forces (ESAF). Reportedly cleaning rods were not included in the purchase price in order to keep the cost down. This illogical "packaging" nearly rendered these weapons unusable. Fortunately, US advisors training the ESAF were able to acquire sufficient cleaning rods until the funds for needed cleaning rods could be obtained.

Effective Countermine Equipment. Land mines are a thorny, demoralizing problem. Besides the loss of life and limb, the civilian populace's confidence in its government is seriously impaired, even though such practices are criminally barbaric outside a declared war context. Again, this is one of the significant nuances of LIC: it is peace, yet it really is war. Using simple, commercially available metal detectors, "blast chaps," and special boots has reduced casualties in El Salvador.(16) Inexpensive remote control vehicles such as toy cars with appropriate micro-sensors could be designed, permitting rapid searches ahead of the operators.

Effective Night Vision Equipment. Depriving the enemy of the cover of darkness seriously impairs his freedom of movement and threatens his organizational security. Since much of the insurgent resupply effort occurs at night, night interdiction capability is a must. Providing our allies with affordable night vision devices can enhance their combat effectiveness. Aircraft and helicopter cockpit lighting should also be compatible with pilot night vision goggles whenever practical.(17)

Sustainable Equipment. The case of the C-130A and Z model aircraft given to Chad to help in their efforts against Libya provides an example of good intentions gone awry. The transfer of these "old, outdated" aircraft did not impact the overall military capability of the donor nations. Spare parts were very difficult to obtain. In some cases, they took over 18 months to procure. This lack of sustainability rendered the aircraft virtually useless and made the "donors" look bad.(18)

Short Takeoff and Landing (STOL) Aircraft. There is a need for low cost STOL aircraft to operate out of the many short, unprepared airstrips throughout the globe. They could be fixed, tilt, and/or rotary wing. They must be affordable in both purchase and maintenance costs, easy to sustain and operate, and rugged. They can perform a variety of roles such as airlift, gunship, reconnaissance, and medical evacuation. One such application in El Salvador is worth mentioning. In the 1982-1983 time frame, the leftist forces were operating in large,

battalion-like groups. The El Salvadoran Armed Forces were having great difficulty combatting such groups, who still could pick and choose the time and place of their attacks. Many observers felt El Salvador was about to go the way of Nicaragua. However, six old C-47 aircraft were refurbished and outfitted as gunships. They used belt-fed fifty caliber machine guns aimed with old iron reticle sights. Many believe these gunships helped immeasurably against the insurgent forces, not only measured by insurgents killed and wounded but by the intimidation the platforms represented. Old airplanes, old guns, iron sights, and less than three million dollars apiece--the right level of technology at the right time.(19)

Low Cost, Secure, Compatible, and Mobile Communications. Secure communications in counterinsurgent and counternarcotic operations are essential but often overlooked. The "bad guys" can easily monitor unguarded government transmissions with a simple scanner and take advantage of such "openness." Low cost, secure, simple to operate, and mobile communications can greatly aid our developing nation allies against these threats. Compatibility will simplify combined operations and, with proper design, should ease logistics support requirements.

Environment-unique Surveillance Systems. As most US COIN support is often viewed as an "economy of force" operation, finding significant targets out of vast surveillance areas is a key capability. Many environments provide uniquely different surveillance problems. Three of special interest in LIC are: heavy foliage, desert, and urban.(20)

Heavy foliage systems. As in Vietnam, detecting man-sized, non-radar significant targets in heavy foliage is very difficult. Most countries do not have adequate manpower or the required infrastructure to cover large areas effectively and economically Aerial systems can provide rapid and wide area coverage, but finding aerial sensors to reveal "what's hiding in the jungle" is another matter. Even IR scanners miss many potential targets. No one sensor will totally open up the jungle. But computer-aided interpretation may help the analyst to quickly correlate the various ground and airborne sensor inputs. A composite "open window" picture may soon result.

Desert systems. The desert environment is normally easy to cover. Vehicle movement, lines of communication, and bivouacs are usually easy to spot. Terrain analysis can eliminate much of what needs to be scanned. However, finding three saboteurs in a three hundred square mile area can still be difficult. The heat differential between the ground and people may not be enough to make IR scans effective. The Israelis were reported to have lost several tanks from anti-tank crews who suddenly popped-up from camouflaged locations buried in the sand. Anti-tank mines can also be well hidden. Multi-spectral analysis using artificial intelligence and other computer-unique capabilities may

significantly enhance the ability to spot such targets. By comparing a "frozen" data base with "current" information, certain types of targets can be spotted very quickly.(21)

Urban surveillance systems. As the search for hostages in the Beirut area has revealed, locating and tracking people and/or weapons in urban areas is extremely difficult. The amount of hidden weapons found during the search of Beirut by the Israelis was very surprising, both in terms of the quantity of weapons found and the fact the caches had escaped prior detection. Systems to search urban blocks unobtrusively, to "see inside" buildings, and scan for various targets have reportedly been under development.

Potential Peacetime Contingency Operation Needs

Peacetime contingency operations (PCO) are politically sensitive military operations characterized by the short-term, rapid projection or employment of forces in conditions short of conventional war. Distinguishing characteristics of PCO include orientation on a specific center of gravity and the intention to deal with that center of gravity with a single stroke. These characteristics normally require tailored forces, short duration, and joint and/or combined operations.(22)

There are several potential PCO needs to highlight. The systems include:

- o Remotely piloted vehicles.
- o Mission rehearsals.
- o Unattended ground sensors.
- o "Available" surveillance platforms.

Remotely Piloted Vehicles (RPVs). US presence in a country or region may be limited, making collection of effective, timely intelligence imperative. Spy satellite information referred to by President Carter in a 1978 speech may not be available.(23) Manned platforms like the SR-71 and RF-4 may give away operations security. Remotely Piloted Vehicles with low radar cross sections and low noise output may provide a solution as they can be nearly invisible. Israeli use of RPVs in the Bekaa Valley in Lebanon provides an excellent example.(24) Remotely Piloted Vehicles performed the reconnaissance and observation and also served as the decoys which caused the Syrians to activate their SA-6 radars. The resulting destruction of numerous sites was a spectacular success. Remotely Piloted Vehicles may have several other uses. They can be weapons platforms; dispense mines and leaflets; be loudspeaker carriers; and imitate aircraft noise, thermal, and/or radar signatures. They can also serve as communication relays in a region. Good, continuous radio communication is a persistent day-to-day problem in many global areas. Rather than overburden satellite resources, an RPV relay may solve US and allied telecommunications problems.

Mission Rehearsals. When the US conducts contingency operations such as in Grenada and Libya, US forces should have a very high probability of success. Recent congressional and public scrutiny has made success of these "high visibility" missions even more important. Computer simulations can help. During simulations, portions of the globe can be graphically reproduced in great detail. Aircrews can see terrain, buildings, and targets with nearly the same visual cues they would have on an actual mission. The same is possible for troops on the ground. Systems similar to the Simulation Network being developed by the Defense Advanced Research Projects Agency may provide a cost effective training tool for LIC operations.(25)

Unattended Ground Sensors (UGS). Developing low cost unobtrusive UGS to aid in monitoring specific items of interest fills an important need. Insurgents often attack key economic facilities such as bridges and power sub-stations. Protecting these key facilities can easily overextend an ally's limited resources. UGS, when properly used, can help thwart such attacks. They can also monitor remote areas adversaries use for base camps, training, and resupply.

"Available" Surveillance Platforms. If necessary, most LIC surveillance missions can be performed by traditional platforms such as the RF-4, TR-1, or the SR-71. However, on a day-to-day basis, competing tactical reconnaissance requirements may make these assets unavailable for LIC use. Therefore, other aerial platforms need to be explored. Remotely Piloted Vehicles and STOL aircraft, already discussed, can do the job. Another platform to consider is the blimp or airship. It has long loiter capabilities, moves slowly, and can carry a significant payload. It can be designed to launch and recover RPVs, which can perform close-in surveillance work.(26) The airship can also carry the needed computer equipment to fuse RPV, UGS, and other intelligence information. Another concept suggests mounting surveillance sensors on utility aircraft already in use and supported in Third World countries.(27)

Potential Combatting Terrorism Needs

Terrorism is the unlawful use or threatened use of force or violence against individuals or property for coercing or intimidating governments or societies, often for achieving political, religious, or ideological objectives. Combatting terrorism is those defensive (antiterrorism) and offensive (counterterrorism) measures to meet the terrorism threat.(28)

Despite the vast array of previously mentioned technologies, most of which can be used to combat terrorism, there is still a fundamental problem. As Paul Robinson, former Associate Director of National Security at Los Alamos National Laboratory, stated, "The number of things a terrorist can do is far greater than can ever be defended against."(29) Narrowing when and where these

events may occur becomes of utmost importance. By using indicators such as money transfers, arms shipments and hijackings, some predictive success has been achieved. President Reagan, during the time frame of the Libyan strike, indicated the FBI had thwarted over 60 potential operations aimed at the US.

A number of interesting technologies are highlighted in a June 1986 Special Edition of Discover Magazine. They include: argon-based molecular samplers, pop-up truck barriers, airport explosive detectors for multiple substances, lightweight body armor, and various intrusion alarms. Using technologies like these to form concentric circles of sensors at key installations such as airports and power plants may preclude disasters like the one in Vienna.(30) However, Mr Harvey McGeorge, a security technology expert on terrorism, leaves us some sobering comments: "If embassies [and airports] are secure, terrorists will shift their targeting to business or tourism. By hardening up the traditional targets, we're effectively endangering common American citizens abroad."(31) Mr Bruce Hoffman, a Rand Corporation analyst, further concludes, "Terrorists don't work to overcome a particular anti-terrorist technology. They choose a softer target. Or they change tactics rather than devices."(32) The most effective anti-terrorist system is still the dedicated police force which takes advantage of all the technical and non-technical information available to thwart terrorist attacks.(33) Determining ways to effectively locate car bombs and other similar devices is another difficult task. Molecular sniffers may provide a good alerting system, but there are some indications that a simple plastic bag may obscure quick detection.(34)

Potential Peacekeeping Operation Needs

Peacekeeping operations (PKO) are military operations conducted in support of diplomatic efforts to achieve, restore, or maintain peace in areas of potential or actual conflict.(35)

Almost all of the sensors, secure communications, and intelligence fusion systems previously mentioned have application in PKO. However, operation of overt intelligence collection systems should be clearly understood as part of the peacekeeping rules. Otherwise, impartiality and effectiveness of the peacekeepers may be seriously impaired. During a PKO, distinguishing friend from foe may be a serious problem. Having accurate intelligence on and a good communications network with the major, active players is another primary consideration. Otherwise, PKO personnel may not keep the antagonists separated long enough for the PKO agreements to take effect. As most PKO personnel are instructed only to shoot as a self-defense measure, protection of the PKO force can become even more difficult than in some combat operations. Preventing terrorist attacks such as occurred in Beirut should be a primary consideration in planning and executing any PKO.

Technology tools of importance in PKO which have not been mentioned previously include the following: lightweight body armor, accurate ground maps, and modular tactical force protection equipment packages.

Lightweight Body Armor. Much has been written about lightweight body armor made out of layered kevlar.(36) Having a normal looking, kevlar-lined overcoat available to PKO personnel can allow them to present a low key, "barely visible" presence to the civilian populace. On the other hand, the situation may dictate an obvious, "high visibility" combat presence.

Accurate Ground Maps. Having up-to-date map data can be a critical ingredient to an effective PKO as well as many other types of operations. In Beirut, almost all aspects of the city were completely revamped due to the war. Peacekeeping forces must have accurate maps to indicate the exact location of major antagonists. When directing patrols into trouble spots, avenues of escape must be clearly defined and understood. Should a rescue operation or protecting gunfire be required, accurate coordinates must be immediately available. This lack of availability was reported as one of the major difficulties in timely and accurate naval gunfire during the Beirut PKO. If two dimensional "LANDSAT" data can be computer-enhanced to give a three dimensional, all-aspect view of an area, then accurate maps can be made.(37) The key is developing the ability to quickly develop such maps from the multitude of raw imagery sources.

Modular Tactical Force Protection Equipment Packages. The safety and security of PKO personnel has been in the planning forefront since the Beirut bombing. Developing an adequate operational concept with appropriate hardware has become a significant thrust within DOD. This program is known as Tactical Force Protection. Four basic phases are involved in protecting personnel and bases: detection, assessment, delay, and deterrence.(38) By layering combinations of various UGS, manned observation systems, "expert" computer assessment systems, pop-up barriers, blinding lights, and other delay/deterrence items, operating location security can be greatly enhanced.

PART III

CONCLUDING REMARKS

Technological innovation is one of America's abiding strengths. It has taken us to the moon and makes the Space Defense Initiative more than just a dream. In LIC, however, this technological strength can become a weakness, if not applied properly or if considered "the answer." As the US discovered in Vietnam, those possessing the technological high ground do not always win. As previously asserted in this paper, the US and our allies can only win in LIC with **the right organization, the right strategy, and the right technology tools.**

In dealing with LIC, there really are no "new" lessons to learn. This quote from 1961 provides food for thought:

> We know in our hearts that we are in the world for keeps, yet we are still tackling 20-year problems with 5-year plans, staffed with 2-year personnel working with 1-year appropriations. It's simply not good enough.(39)

What is difficult about LIC, especially the COIN aspects, is there are so many major players who must work closely together to make the US system work. Consider the departments and agencies the President and his National Security Council must coordinate and work with on LIC issues. At a minimum, they include:

- Congress.
- Department of State.
- Central Intelligence Agency.
- US Agency for International Development.
- US Information Agency (known overseas as the US Information Service).
- Drug Enforcement Agency.
- Department of Defense.

"Turf" battles invariably follow, making the development and implementation of an integrated interagency policy and strategy a formidable task. The need for developing an integrated technology policy and strategy becomes even more critical as the competition for scarce resources intensifies. Developing realistic priorities will be difficult. Determining the real LIC needs from the "nice to have" and panaceas must be done. If LIC is the most likely threat we face for the remainder of this century, then some tough choices lie ahead.(40) Within DOD, making realistic tradeoffs between LIC and important mid- to high-intensity warfare systems may become necessary. The newly formed Office of Assistant Secretary of Defense for Special Operations and Low Intensity Conflict will be tackling these and other similarly difficult issues. Other government departments and agencies are probably facing similar dilemmas in confronting LIC. The newly formed Board for Low Intensity Conflict, which advises the National Security Council, faces a vital and difficult challenge in the days and years ahead. The LIC Board must shape and help build the public, congressional, and interagency consensus needed to be successful in LIC. This consensus, in which technology will have a significant role, requires long-term policies, strategies, and funds in order for the US and our allies to win in LIC.

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